Reg. No. :

Question Paper Code: 33403

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Electronics and Communication Engineering

01UEC303 - CIRCUIT THEORY

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State Kirchoff's voltage and current law.

2. When do we go for supermesh and supernode analysis?

3. State Tellegen's theorem.

4. Give the condition for maximum power transfer theorem.

5. When the current is maximum in the series resonance circuit? Why?

6. Obtain the natural frequency and time constant of an RLC series circuit with R = 1kΩ, L=100 H and C=0.1 μF

7. Give the conditions for balanced star connected load.

8. Two wattmeter method is used to measure power in a three phase load. The wattmeter readings are 400W and -35W, Calculate the power factor.

9. Define driving point and transfer point impedances.

10. Express Z parameters in terms of Y parameters.

PART - B (5 x 16 = 80 Marks)

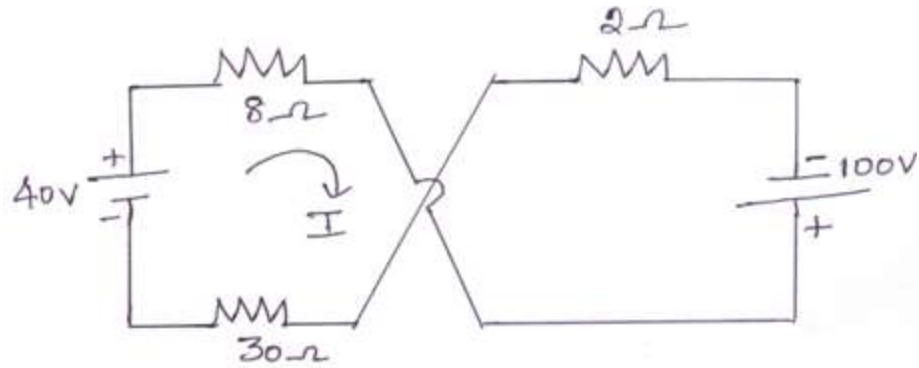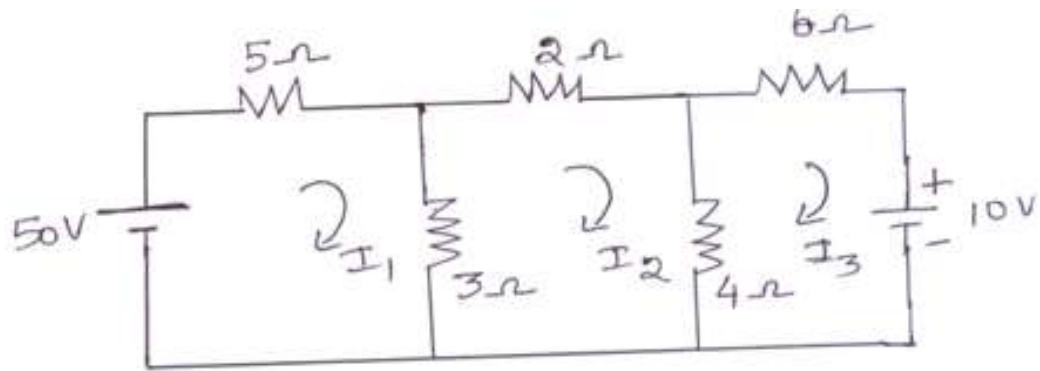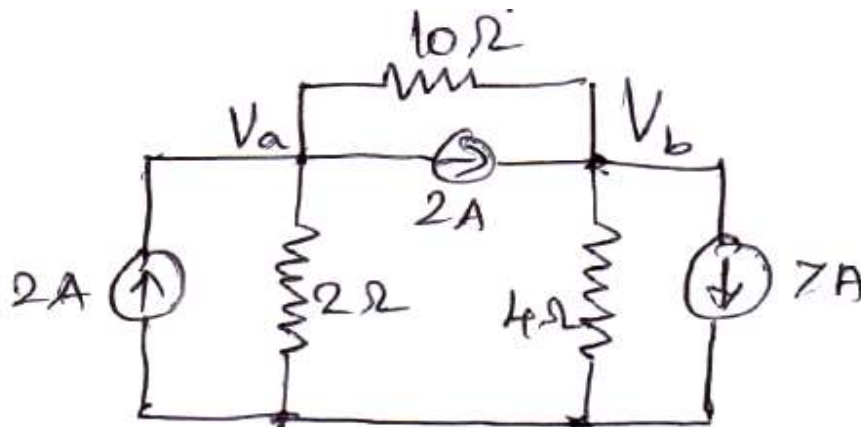11. (a) (i) Find the current I and voltage across 30Ω resistor for the circuit shown in fig.

(8)

Fig.

(ii) Determine the power dissipation in the 4Ω resistor of circuit shown in fig using mesh analysis. (8)
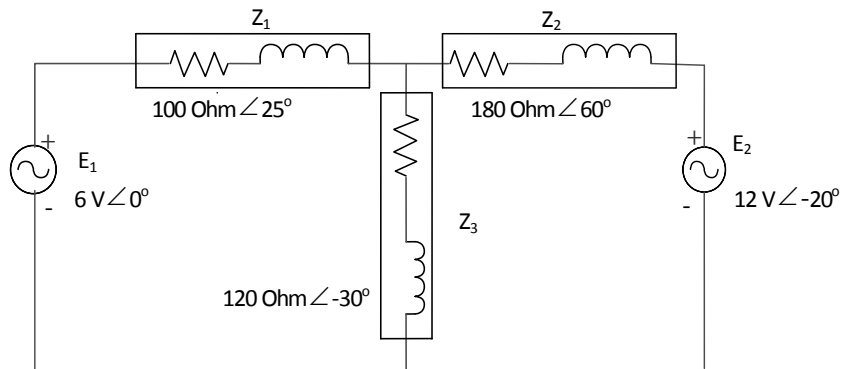

Or

(b) (a) (i) Find the node voltage V_a and V_b which is shown in Figure (16)

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12. (a) State and explain Maximum power transfer theorem. Also give its applications. (16)

Or

(b) Using superposition theorem, Analyze the impedance network in the given figure and derive an equation for the current through Z_3. (16)

13. (a) A step voltage v (t) = 100 u(t) is applied to a series RLC circuit with L = 10H, R = 2Ω and C = 5F. The Initial current in the circuit is zero but there is a initial voltage of 50V on the capacitor in a direction which opposes the applied source. Find the expression for the current in the circuit. (16)

Or

(b) Express the current response of RL series circuit with an excitation of $V_m \sin \omega t$ and obtain the complete solution. (16)

14. (a) With a neat circuit and phasor diagram explain the three phase power measurement by two wattmeter methods. (16)

Or

(b) A three phase balanced Delta connected load of 4 + j8 is connected across 400V, 3-phase balanced supply. Find the phase and line currents, also power drawn by the load. (16)

15. (a) The impedance parameters of a 2 port network are
$Z_{11} = 6\Omega$, $Z_{22} = 4\Omega$, $Z_{12} = Z_{21} = 3\Omega$

Compute Y parameters and $ABCD$ parameters. (16)

Or

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(b)   Find the h parameter of the network shown in figure   (16)

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